**ĐỀ THI SỐ 1**

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Artificial intelligence (AI) technology developed by researchers at the **University of Waterloo** is capable of assessing the severity of COVID-19 cases with a promising degree of accuracy. A study, which is part of the COVID-Net open-source initiative launched more than a year ago, involved researchers from Waterloo and spin-off start-up company **DarwinAI**, as well as radiologists at the **Stony Brook School of Medicine** and the **Montefiore Medical Center** in New York.  Deep-learning AI was trained to analyze the extent and opacity of infection in the lungs of COVID-19 patients based on chest x-rays. Its scores were then compared to assessments of the same x-rays by expert radiologists. For both extent and opacity, important indicators of the severity of infections, predictions made by the AI software were in good alignment with scores provided by the human experts.  Alexander Wong, a systems design engineering professor and co-founder of DarwinAI, said the technology could give doctors an important tool to help them manage cases. "Assessing the severity of a patient with COVID-19 is a critical step in the clinical workflow for determining the best course of action for treatment and care, be it admitting the patient to ICU, giving a patient oxygen therapy, or putting a patient on a mechanical ventilator," Wong said. | |
|  | **How many organization involved in Covid-Net?** |
| A | 4 |
| B | 3 |
| C | 5 |
| D | 2 |
|  | **How does deep learning AI assess the severity of infections?** |
| A | It compares the extent and opacity with expert radiologists |
| B | It compares the opacity with expert radiologists |
| C | It compares the extent and opacity with human experts |
| D | It analyzes the lungs of COVID-19 patients |
|  | **How is the role of assessing the severity of a patient with COVID-19?** |
| A | Essential |
| B | Trivial |
| C | General |
| D | Average |
|  | **Where the tools for assessing the severity of a patient with COVID-19?** |
| A | University of Waterloo |
| B | DarwinAI |
| C | Stony Brook School of Medicine |
| D | Montefiore Medical Center in New York. |
|  | **What is the important indicators for the severity of a patient with COVID-19?** |
| A | extent and opacity |
| B | Opacity |
| C | Extent |
| D | patient oxygen |

**ĐỀ THI SỐ 2**

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Northwestern University researchers are using artificial intelligence (AI) to speed up the search for COVID-19 treatments and vaccines. The AI-powered tool makes it possible to prioritize resources for the most promising studies -- and ignore research that is unlikely to yield benefits.  In the midst of the pandemic, scientific research is being conducted at an unprecedented rate. The Food and Drug Administration and the U.S. Department of Health and Human Services announced plans to accelerate clinical trials, and hundreds of scientists are investigating possible treatments and vaccines. But the question remains: Which research has the most potential to produce real, much-needed solutions?  The scientific community has been predicting the answer to such questions for decades using the Defense Advanced Research Projects Agency's Systematizing Confidence in Open Research and Evidence (DARPA SCORE) program. The program relies on scientific experts to review and rate submitted research studies based on how likely they are to be replicable. On average, this process takes about 314 days -- a long wait in the midst of global pandemic. The machine model is just as accurate as the human scoring system at making such predictions, researchers said, and it can scale up to review a larger number of papers in a fraction of the time -- minutes instead of months. | |
|  | **How AI tool can speed up the search for COVID-19 treatment?** |
| A | It makes it possible to focus on the potential research |
| B | It makes it possible to ignore a lot of research |
| C | It makes it possible to prioritize the treatment |
| D | It makes it possible to prioritize the resource for patients |
|  | **What is the meaning of ‘unprecedented’ in the second paragraph?** |
| A | Never seen before |
| B | Very fast |
| C | Too slow |
| D | Have happened before |
|  | **What is not found in COVID-19 research?** |
| A | The most promising solution |
| B | The best solution |
| C | The best promising solution |
| D | The worst solution |
|  | **314 days is the period to ?** |
| A | Find the most potential solution |
| B | Predict the best solution |
| C | Develop the therapy for COVID-19 |
| D | Find a good solution |
|  | **How does the machine model help to find the most promising solution** |
| A | It speeds up the review |
| B | It reviews a paper in a month |
| C | It increases the number of papers |
| D | It find the best solution |

**ĐỀ THI SỐ 3**

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Researchers from UTSA, the University of Central Florida (UCF), the Air Force Research Laboratory (AFRL) and SRI International have developed a new method that improves how artificial intelligence learns to see. Led by Sumit Jha, professor in the Department of Computer Science at UTSA, the team has changed the conventional approach employed in explaining machine learning decisions that relies on a single injection of noise into the input layer of a neural network.  The team shows that adding noise -- also known as pixilation -- along multiple layers of a network provides a more robust representation of an image that's recognized by the AI and creates more robust explanations for AI decisions. This work aids in the development of what's been called "explainable AI" which seeks to enable high-assurance applications of AI such as medical imaging and autonomous driving.  "It's about injecting noise into every layer," Jha said. "The network is now forced to learn a more robust representation of the input in all of its internal layers. If every layer experiences more perturbations in every training, then the image representation will be more robust and you won't see the AI fail just because you change a few pixels of the input image." | |
|  | **What is developed by the researchers from UTSA?** |
| A | A new method to enhance the ability to see of AI |
| B | A new method to explain the ability to see of AI |
| C | A new method to improve the ability of AI to speech |
| D | A new method to improve AI approaches |
|  | **What methods is used by the team from UTSA?** |
| A | Input noise to multiple layers |
| B | Input noise to single layers |
| C | Input pixilation to single layers |
| D | Input data to multiple layers |
|  | **What is the ‘pixilation’ in the second paragraph?** |
| A | Noise |
| B | Voice |
| C | image |
| D | Input |
|  | **What is the best applications of explainable AI?** |
| A | High-assurance applications |
| B | Image process |
| C | Image applications |
| D | Medical treament |
|  | **Which model has a good representation?** |
| A | Model does not fail when the input changed |
| B | Model fail when the input changes |
| C | Model does not field when the input unchanged |
| D | Model predict wrongly when the input changed |

**ĐỀ THI SỐ 4**

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| ISDN services can be carried over existing telephone network infrastructure to terminal adapters (TAs) in the client machine. A common ISDN interface standard has a digital communications line consisting of three independent channels: two Bearer (B) channels, each at 64Kbit/s, and one Data (D) channel at 16Kbit/s. The D channel is used to carry signalling and supervisory information to the network, while the B channels carry the data and can be linked to provide a 128Kbit/s data channel.  The wireless alternatives come in two forms: satellite and cellular. Satellite systems require the use of a modem to maintain the upload. Downstream bandwidth is provided via a dedicated satellite dish, connector hardware and proprietary software. Cellular systems use assigned radio frequencies and are based around a network of transmitters that are arranged in a cellular network, much like cellular mobile phone systems.  DSL technology uses the existing network of copper infrastructure, but allows digital signals to be carried rather than analogue. It allows the full bandwidth of the copper twisted-pair telephone cabling to be utilised. With splitter-based services, the DSL signal is pulled out from the phone line as it enters your premises and is wired separately to a DSL modem. | |
|  | **What is the channels in ISDN interface standard?** |
| A | Two Bearer channels and one Data channel. |
| B | Two independent channels |
| C | The D channel |
| D | the B channels |
|  | **What is the Bearer channels used for ?** |
| A | carry the data |
| B | carry signalling |
| C | supervise information |
| D | carried information over existing telephone network |
|  | **What do the Satellite systems require?** |
| A | A modem |
| B | A satellite |
| C | A cellular |
| D | A phone |
|  | **What is the cable used in DSL technology?** |
| A | The copper infrastructure |
| B | The phone line |
| C | The fiber cable |
| D | The radio wave |
|  | **What kinds of signal is transmitted in DSL?** |
| A | Digital signal |
| B | Analog signal |
| C | Light signal |
| D | Radio signal |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Most PCs are held back not by the speed of their main processor, but by the time it takes to move data in and out of memory. One of the most important techniques for getting around this bottleneck is the memory cache.  The idea is to use a small number of very fast memory chips as a buffer or cache between main memory and the processor. Whenever the processor needs to read data it looks in this cache area first. Only if the data is not in the cache does it need to access main memory, but in the process it copies whatever it finds into the cache so that it is there ready for the next time it is needed. The whole process is controlled the cache controller.  One of the cache controller's main jobs is to look after 'cache coherency' which means ensuring that any changes written to main memory are reflected within the cache and vice versa. There are several techniques for achieving this, the most obvious being for the processor to write directly to both the cache and main memory at the same time. This is known as a 'write-through' cache and is the safest solution, but also the slowest. | |
|  | **What is the main cause for the bottleneck in PCs?** |
| A | The time to move data in and out of memory. |
| B | The main processor is too slow |
| C | The speed of their main processor is too high |
| D | The time to process data in the memory. |
|  | **Where does the processor first look in when it needs to read data?** |
| A | the cache |
| B | The main memory |
| C | The main processor |
| D | the cache controller |
|  | **What is the main jobs of the cache controller?** |
| A | Maintain the coherency of the cache |
| B | Copy data the cache |
| C | Move data into the memory |
| D | look after the prosessor |
|  | **What does the processor do if the data is not in the cache?** |
| A | It copy to the main memory. |
| B | It copy to the cache |
| C | It move data to the main memory |
| D | It process the data in the main memory |
|  | **What does the processor do to maintain “cache coherency”?** |
| A | Write to both the cache and the main memory |
| B | Copy to both the cache |
| C | Copy to both the main memory |
| D | Delete from both the cache and the main memory |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| RAID is an arrangement a redundant array of inexpensive disks. By arranging drives in sets, users hope to take advantage of the higher seek times of smaller drives. RAID schemes are numbered, with higher numbers indicating more elaborate methods for ensuring data integrity and fault tolerance.  RAID 0 Called disk striping breaks data into blocks that are spread across all drives rather than filling one before writing to the next. It is the fastest of all RAID configurations as it distributes read/write operations across multiple drives.  RAID 1 Called disk mirroring, RAID 1 uses two identical drives: data written to the first is duplicated on the second. If either drive fails, the other continues to provide uninterrupted access to data.  RAID 2-4 are rarely used and simply enhance the striping provided by other RAID levels. 2 enhances 0 by using additional drives to store parity data. 3 enhances 2 by requiring only one error-checking drive. 4 builds on 3 by using larger block sizes. The disadvantage is that up to 30% more hard disk space needed than 1.  RAID 5 Called striping with parity, the popular RAID 5 writes error-correcting, or parity, data across available drives. | |
|  | **Which RAID uses two identical drives?** |
| A | RAID 1 |
| B | RAID 0 |
| C | RAID 1 and RAID 2 |
| D | RAID 4 |
|  | **How much space does the RAID levels higher than 1 require to store data?** |
| A | Up to about a third more disk space |
| B | At least double the disk space |
| C | Less than haft the disk space |
| D | More than third more disk space |
|  | **Which RAID use larger block size than RAID 2** |
| A | RAID 4 |
| B | RAID 3 |
| C | RAID 5 |
| D | RAID 3 and 4 |
|  | **Which level of RAID is the fastest?** |
| A | RAID 0 |
| B | RAID 1 |
| C | RAID 3 |
| D | RAID 4 |
|  | **Which levels of RAID can reconstruct data lost in failed drives from the backup data** |
| A | RAID 3, 4 and 5 |
| B | RAID 5 |
| C | RAID 3, 4 |
| D | RAID 2, 4 and 5 |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| One of the principal motivations for using OOP is to handle multimedia applications in which such diverse data types as sound and video can be packaged together into executable modules. Another is writing program code that's more intuitive and reusable; in other words, code that shortens program-development time.  Perhaps the key feature of OOP is encapsulation - bundling data and program instructions into modules called 'objects'. Here's an example of how objects work. An icon on a display screen might be called 'Triangles'. When the user selects the Triangles icon - which is an object composed of the properties of triangles and other data and instructions - a menu might appear on the screen offering several choices. A second key feature of OOP is inheritance. This allows OOP developers to define one class of objects, say 'Rectangles', and a specific instance of this class, say 'Squares' (a rectangle with equal sides). Thus, all properties of rectangles - 'Has 4 sides' and 'Contains 4 right angles' are automatically inherited by Squares. Inheritance is a useful property in rapidly processing business data.  A third principle behind OOP is polymorphism. This means that different objects can receive the same instructions but deal with them in different ways. For instance, consider the triangles example. If the user right clicks the mouse on 'Right triangle', a voice clip might explain the properties of right triangles. However, if the mouse is right clicked on 'Equilateral triangle' the voice instead explains properties of equilateral triangles. | |
|  | **What multimedia data types are referred to in the text?** |
| A | Sound and Video |
| B | Sound, Video, and Text |
| C | Voice and video |
| D | Sound and Graphics |
|  | **How many type of triangles mentioned in the text** |
| A | 2 |
| B | 3 |
| C | 1 |
| D | 4 |
|  | **What is specific type of Rectangle mentioned in the text?** |
| A | Squares |
| B | Rectangle |
| C | triangles |
| D | Oval |
|  | **What is key features of OOP?** |
| A | Encapsulation, inheritance and polymorphism |
| B | Encapsulation and inheritance |
| C | Inheritance and polymorphism |
| D | Encapsulation, inheritance and reusability |
|  | **What first advantages of using object-oriented programming are mentioned in the text?** |
| A | handle multimedia application |
| B | shortens program-development time. |
| C | writing more intuitive program code |
| D | writing reusable program |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| As portable computing devices get smarter and more capable, connectivity frustrations increase. This is where Bluetooth comes in. The brainchild of Ericsson, IBM, Intel, Nokia and Toshiba, Bluetooth is a microwave high-speed wireless link system that's designed to work with portable equipment. To that end, it's low power, very small and very low cost. It uses the same frequencies as existing radio LANs (and, incidentally, microwave ovens) to create a secure 1 Mbit/s link between devices within 10 m of each other. These devices can be laptops, PDAs, cellphones, wired telephone access points, even wristwatch devices, headphones, digital cameras and so on. With them, your notebook PC will be able to access your cellular phone — and thus the Internet — without your having to take the phone out of your pocket. Files can be exchanged and communications set up for voice and data between just about any device capable of handling the information.  Bluetooth operates in the unlicensed SM (Industrial, Scientific and Medical) band at 2.45GHz, which is globally available for products. There's 89MHz of bandwidth allocated here, and since Bluetooth is very low power, it actually radiates less than most national and international standards allow non-transmittinp devices to leak as part of their normal operation. This is key, as it allows the technology to operate without restriction on aircraft. | |
|  | **What the problem does Bluetooth solve?** |
| A | connectivity |
| B | computing devices |
| C | high-speed wireless |
| D | portable equipment |
|  | **Who first developed Bluetooth?** |
| A | Ericsson, IBM, Intel, Nokia and Toshiba, Bluetooth |
| B | Ericsson |
| C | IBM |
| D | Nokia and Toshiba, Bluetooth |
|  | **Why is Bluetooth particularly suited to portable systems?** |
| A | low power, very small and cheap |
| B | very small and very low cost. |
| C | low power, very small but expensive. |
| D | Cheap and low power |
|  | **What do Bluetooth devices share with microwave ovens?** |
| A | frequencies |
| B | telephone access points |
| C | bandwidth |
| D | wristwatch devices |
|  | **Which devices is not suitable for use with Bluetooth?** |
| A | Servers |
| B | cellphones |
| C | digital cameras |
| D | laptops |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Near-line and offline storage (often called Hierarchical Storage Management) is the modern way of dealing with current storage needs. Hard disks are becoming cheaper, but data storage requirements are higher, so it's better to plan for HSM than assume disks can continually be added to systems.  The most common HSM setup is where there's online storage (the hard disk), near-line storage (some sort of fast media from where a file can be quickly retrieved), and offline storage (slower media that might take some time for files to be recovered). Data is automatically moved from the online disk to the near-line optical media if it hasn't been accessed for a definable period of time. This near-line system is likely to be erasable optical disks in some form of jukebox.  The system has to operate on the basis that a user won't know that a file has been moved into near-line storage. Therefore some marker is left in the directory structure on the disk so that the user can still see the file. If the user then tries to open it, the file will automatically be copied from near-line to online storage, and opened for the user. | |
|  | **What is the modern way to deal with the higher storage need?** |
| A | Hierarchical Storage Management |
| B | Near-line |
| C | Offline storage |
| D | Hard disks |
|  | **Where is HSM not setup?** |
| A | Datalake |
| B | Offline storage |
| C | Near-line |
| D | The hard disk |
|  | **When is data automatically moved from the online disk to the near-line optical media?** |
| A | it hasn't been accessed for a definable period of time |
| B | it's better to plan for HSM |
| C | It will automatically be copied |
| D | It opened for the user |
|  | **What is the near-line system likely to be?** |
| A | erasable optical disks |
| B | opened for the user |
| C | Accessed by the user |
| D | Copied from the optical disks |
|  | **What happen if the user tries to open a file in near-line?** |
| A | copied from near-line to online storage |
| B | erasable optical disks |
| C | Copied from the optical disks |
| D | Copied from online storage |

**Task 1. Read text and select the correct answer**

|  |  |
| --- | --- |
| Adam Burden, North America technology lead for business and technology advisory firm Accenture, has a firm opinion on cloud training. "All leaders should make cloud training a priority—it's a technology that's fundamentally reshaping every industry and is the main ingredient for digital businesses," he stated. In IT specifically, cloud fluency will be needed to deliver on the promise of digital transformation. "More broadly, being conversant in cloud technology will be needed to recognize opportunities and stimulate innovation across the enterprise," Burden added.  Burden noted that IT leaders shouldn't count on being able to hire their way out of the challenge of building a cloud-savvy organization. "Success will mean transforming the talent you have into the talent you need, and that happens through a comprehensive learning program that considers the learning profiles, point skills, certifications, and the enterprise-specific details that a digital enterprise requires."  For organizations of all types and sizes, cloud computing is fueling business differentiation in ultra-competitive markets while helping to accelerate the delivery of innovative customer-centric solutions. "If you're not making cloud training a priority already, you’re lagging and will find it hard to catch up," warned Angela Moynahan, director of technology learning for Liberty Mutual Insurance. | |
|  | **How is Adam Burden’s opinion on the important of cloud training?** |
| A | Strong |
| B | Weak |
| C | Hate |
| D | Uncertain |
|  | **What is the meaning of term ‘innovation’ in the first paragraph?** |
| A | Revolution |
| B | Introduction |
| C | Variation |
| D | Deviation |
|  | **What is the note of Adam Burden’s training program?** |
| A | IT leaders should organize a comprehensive learning program |
| B | IT leaders shouldn't do comprehensive learning program |
| C | IT leaders should find the talent |
| D | IT leaders should build a cloud-savvy organization for training |
|  | **What is not considered when organizing a training program?** |
| A | cloud-savvy |
| B | learning profiles |
| C | point skills |
| D | certifications |
|  | **What is the warning of Angela Moynahan**? |
| A | You’re lagging if you do not prioritize a cloud training |
| B | You're not making cloud training a priority already you will lose your job |
| C | You can catch up if you do not prioritize a cloud training |
| D | You can not catch up if you prioritize a cloud training |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Though speech recognition may never be a complete replacement for other input devices, future interfaces will offer a combination of input types, a concept known as multimodal input. A mouse is a very efficient device for desktop navigation, for example, but not for changing the style of a paragraph. By using both a mouse and speech input, a user can first point to the appropriate paragraph and then say to the computer, 'Make that bold.' Of course, multimodal interfaces will involve more than just traditional input devices and speech recognition. Eventually, most PCs will also have handwriting recognition, text to speech (TTS), the ability to recognize faces or gestures, and even the ability to observe their surroundings.  At The Intelligent Room, a project of Massachusetts Institute of Technology's Artificial Intelligence Lab, researchers have **given sight** to PCs running Microsoft Windows through the use of video cameras. 'Up to now, the PC hasn't cared about the world around it,' said Rodney A. Brooks, the Director of MIT's Artificial Intelligence Lab. 'When you combine computer vision with speech understanding, it liberates the user from having to sit in front of a keyboard and screen.'  It's no secret that the amount of information - both on the Internet and within intranets - at the fingertips of computer users has been expanding rapidly. This information onslaught has led to an interest in intelligent agents, software assistants that perform tasks such as retrieving and delivering information and automating repetitive tasks. Agents will make computing significantly easier. They can be used as Web browsers, help-desks, and shopping assistants. Combined with the ability to look and listen, intelligent agents will bring personal computers one step closer to behaving more like humans. This is not an accident. Researchers have long noted that users have a tendency to treat their personal computers as though they were human. By making computers more 'social,' they hope to also make them easier to use. | |
|  | **What is multimodal input?** |
| A | Combination of more than input types |
| B | Mouse and keyboard |
| C | Keyboard |
| D | Speech |
|  | **What task is a mouse not so useful?** |
| A | Changing the style of a paragraph |
| B | Desktop navigation |
| C | Input data |
| D | Select a paragraph |
|  | **What is meaning of ‘liberates’ in the second paragraph?** |
| A | Free |
| B | Contain |
| C | Combine |
| D | Help |
|  | **What type of input device will be used to give vision to the user interface?** |
| A | video cameras |
| B | Mouse |
| C | Keyboard |
| D | Screen |
|  | **What development has led to an interest in intelligent agents?** |
| A | The rapid increase of information on the Internet and within intranets. |
| B | The rapid development of speech recognition technology |
| C | The rapid increase in the usage of computer |
| D | All three answer |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Providing applications and storage space for vast numbers of users requires some powerful technology on the part of the ASP. This includes security controls and data storage as well as providing the physical links to customers. For the most part, ASPs don't own the data centres that store the information. Instead, they lease space from data storage specialists. In this way, they can be confident of meeting customers' increasing storage requirements by buying more space as it's needed.  There's a wide variety of applications available for use via ASPs. Office suite applications and email services are two of the most generic applications available through ASPs. Large, complex business applications such as enterprise resource planning tools like SAP are another popular candidate for delivery through an ASP. Other business services, such as payroll and accounting systems are also available. This is particularly beneficial to small businesses which are likely to grow quickly and don't want to deal with the problems caused by outgrowing their existing system and having to move to a high-end package. ASPs also offer a means of using specialist tools that would otherwise prove prohibitively expensive. Small businesses have the opportunity to use such tools for short periods of time as and when they need them, rather than having to buy the software as a permanent investment.  One of the major barriers for small businesses which want to make a start in e-commerce is ensuring that they have sufficient resources to cope with sudden large increases in customers. This means not only having adequate storage for all your customers' details, but ensuring that you have the technology in place to handle stock levels, efficient delivery and large volumes of traffic. It's very rare for an e-commerce business to handle all of these elements by itself, making this one of the best-established areas of ASP use. | |
|  | **How does an ASP ensure that they have enough storage space for the changing needs of customers?** |
| A | They lease space from data storage specialists |
| B | They own the data centres |
| C | They providing the physical links to customers |
| D | They use security controls and data storage |
|  | **What types of applications are not available from ASPs?** |
| A | Domain name service |
| B | SAP |
| C | payroll and accounting systems |
| D | Office suite |
|  | **Why is it useful for a small business to be able to rent specialist tools from an ASP?** |
| A | Tools are very expensive |
| B | Tools are time-consuming to develop |
| C | Tools are very cheap |
| D | Tools are easy to use |
|  | **What is one of the best established areas of ASP use?** |
| A | e-commerce |
| B | Small businesses |
| C | Medium enterprise |
| D | Large enterprise |
|  | **What is two most popular services provided by ASPs?** |
| A | Office suite and email |
| B | payroll and accounting systems |
| C | specialist tools and enterprise resource planning tools |
| D | Payroll and e-commerce software |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| The most common system for the compression of video is MPEG. It works like this. The single data stream off the CD-ROM is split into video and audio components, which are then decompressed using separate algorithms. The video is processed to produce individual frames as follows. Imagine a sequence of frames depicting a bouncing ball on a plain background. The very first is called an Intra Frame (I-frame). I-frames are compressed using only information in the picture itself just like conventional bitmap compression techniques like JPEG.  Following I-frames will be one or more predicted frames (P-frames). The difference between the P- frame and the I-frame it is based on is the only data that is stored for this P-frame. For example, in the case of a bouncing ball, the P picture is stored simply as a description of how the position of the ball has changed from the previous I-frame. This takes up a fraction of the space that would be used if you stored the P-frame as a picture in its own right. Shape or colour changes are also stored in the P-frame. The next P-frame may also be based on this P-frame and so on. Storing differences between the frames gives the massive reduction in the amount of information needed to reproduce the sequence. Only a few P-frames are allowed before a new I-frame is introduced into the sequence as a new reference point, since a small margin of error creeps in with each P-frame.  Between I and P-frames are bi-directional frames (B-frames), based on the nearest I or P-frames both before and after them. In our bouncing ball example, in a B-frame the picture is stored as the difference between the previous I or P-frame and the B-frame and as the difference between the B- frame and the following I or P-frame. To recreate the B-frame when playing back the sequence, the MPEG algorithm uses a combination of two references. There may be a number of B-frames between I or P-frames. No other frame is ever based on a B-frame so they don't propagate errors like P-frames. Typically, you will have two or three Bs between Is or Ps, and perhaps three to five P-frames between Is. | |
|  | **What information does an Intra frame contain?** |
| A | only information in the picture itself |
| B | Audito and video |
| C | individual frames |
| D | conventional bitmap |
|  | **What is stored in the P-frames following an I- frame?** |
| A | The difference between the P- frame and the I-frame |
| B | only information in the picture itself |
| C | the position of the ball |
| D | Shape or colour changes |
|  | **What is stored in a P-frame in the case of a bouncing ball?** |
| A | the position of the ball changed from the previous I-frame and Shape or colour changes |
| B | Shape or colour changes |
| C | the position of the ball changed from the previous I-frame |
| D | The shape of the ball |
|  | **What gives the massive reduction in the amount of information needed to reproduce a video sequence?** |
| A | Only storing differences between the frames |
| B | Only storing P-frames |
| C | Only storing I-frames |
| D | Only storing differences between the P-frames and I-frames |
|  | **Why is a new l-frame used after a few P- frames?** |
| A | a small margin of error creeps in with each P-frame. |
| B | a small margin of error creeps in with each I-frame. |
| C | a small margin of error in with each B-frame. |
| D | a small margin of error in with each I-frame and P-frame |

|  |  |
| --- | --- |
| The application layer is the only part of a communications process that a user sees. The layer converts a message's data from human-readable form into bits and attaches a header identifying the sending and receiving computers. The presentation layer ensures that the message is transmitted in a language that the receiving computer can interpret. This layer translates the language, if necessary, and then compresses and perhaps encrypts the data. It adds another header specifying the language as well as the compression and encryption schemes. The session layer opens communications and has the job of keeping straight the communications among all nodes on the network. It sets boundaries for the beginning and end of the message, and establishes whether the messages will be sent half-duplex or full-duplex, with both computers sending and receiving at the same time. The details of these decisions are placed into a session header.  The transport layer protects the data being sent. It subdivides the data into segments, creates checksum tests that can be used later to determine if the data was scrambled. It can also make backup copies of the data. The transport header identifies each segment's checksum and its position in the message. The network layer selects a route for the message. It forms data into packets, counts them, and adds a header containing the sequence of packets and the address of the receiving computer.  The data-link layer supervises the transmission. It confirms the checksum, then addresses and duplicates the packets. This layer keeps a copy of each packet until it receives confirmation from the next point along the route that the packet has arrived undamaged. The physical layer encodes the packets into the medium that will carry them - such as an analogue signal, if the message is going across a telephone line - and sends the packets along that medium. | |
|  | **What is the purpose of a transmission checksum test?** |
| A | to determine if the data was error |
| B | to determine if the data was good |
| C | to determine if the data was lost |
| D | to determine if the data was received |
|  | **What units is data subdivided by the transport layer?** |
| A | Segments |
| B | Packages |
| C | Messages |
| D | Frames |
|  | **What units is data is processed by network layer?** |
| A | Packages |
| B | Frames |
| C | Segments |
| D | Messages |
|  | **Which network communications layer is responsible for Supervises the transmission** |
| A | Data-link layer |
| B | Network layer |
| C | Transport layer |
| D | Session layer |
|  | **Which network communications layer is responsible for making backup copies of the data if required** |
| A | Transport layer |
| B | Data-link layer |
| C | Network layer |
| D | Session layer |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Secure transactions across the Internet have three goals. First, the two parties engaging in a transaction (say, an email or a business purchase) don't want a third party to be able to read their transmission. Some form of data encryption is necessary to prevent this. Second, the receiver of the message should be able to detect whether someone has tampered with it in transit. This calls for a message-integrity scheme. Finally, both parties must know that they're communicating with each other, not an impostor. This is done with user authentication.  Today's data encryption methods rely on a technique called public-key cryptography. Everyone using a public-key system has a public key and a private key. Messages are encrypted and decrypted with these keys. A message encrypted with your public key can only be decrypted by a system that knows your private key.  For the system to work, two parties engaging in a secure transaction must know each other's public keys. Private keys, however, are closely guarded secrets known only to their owners. When I want to send you an encrypted message,  I use your public key to turn my message into gibberish. I know that only you can turn the gibberish back into the original message, because only you know your private key. Public- key cryptography also works in reverse - that is, only your public key can decipher your private key's encryption.  To make a message tamper-proof (providing message integrity), the sender runs each message through a message-digest function. This function within an application produces a number called a message-authentication code (MAC). The system works because it's almost impossible for an altered message to have the same MAC as another message. Also, you can't take a MAC and turn it back into the original message. The dynamics of the Web dictate that a user- authentication system must exist. This can be done using digital certificates. | |
|  | **What does data encryption provide?** |
| A | Privacy |
| B | Integrity |
| C | authentication |
| D | Privacy and integrity |
|  | **Which key is used to decyrpt a message encrypted with the recipient's public key?** |
| A | the recipient's private key |
| B | the sender's private key |
| C | the sender's public key |
| D | the recipient's public key |
|  | **What system is commonly used for encryption?** |
| A | Public-key cryptography |
| B | message-digest function |
| C | digital certificates |
| D | private-key cryptography |
|  | **A message-digest function is used to** |
| A | create a MAC |
| B | authenticate a user |
| C | encrypt a message |
| D | dencrypt a message |
|  | **What is use to encrypt a message for sending** |
| A | the recipient's public key |
| B | the recipient's private key |
| C | the sender's private key |
| D | the sender's public key |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Near-line and offline storage (often called Hierarchical Storage Management) is the modern way of dealing with current storage needs. Hard disks are becoming cheaper, but data storage requirements are higher, so it's better to plan for HSM than assume disks can continually be added to systems. HSM is essentially the automatic movement of data between media, the media type used depending on when it was last accessed. Many software and hardware vendors have HSM solutions, and all are based on the same basic techniques.  The most common HSM setup is where there's online storage (the hard disk), near-line storage (some sort of fast media from where a file can be quickly retrieved), and offline storage (slower media that might take some time for files to be recovered, but it is cheaper for a long-term storage). This arrangement is the major thrust of today's systems. Most of the time these systems will comprise optical media for near-line and tape media for offline storage. Data is automatically moved from the online disk to the near-line optical media if it hasn't been accessed for a definable period of time. This is typically three months This near-line system is likely to be erasable optical disks in some form of jukebox.  The system has to operate on the basis that a user won't know that a file has been moved into near-line storage. Therefore some marker is left in the directory structure on the disk so that the user can still see the file. If the user then tries to open it, the file will automatically be copied from near-line to online storage, and opened for the user. All the user notices is a slight time delay while the file is opened.  Moving data from near-line to offline storage can be done using a similar mechanism, but more often the marker left in the directory for the user to see will just contain a reference. This gives the user the facility to request the file back from the systems administrator, and could have information like 'This file has been archived to offline media' and a reference to the tape number that the file is on. This is then sent to the systems administrator and the file can be recovered from tape in the usual way. | |
|  | **What factor determines which type of storage is used to store a file in an HSM system?** |
| A | when the file was last accessed |
| B | Near-line and offline storage |
| C | software and hardware |
| D | the hard disk |
|  | **What happens to data that is not accessed for a long time?** |
| A | It moves from the online disk to the near-line optical |
| B | It is erased |
| C | It move from near-line to online disk |
| D | It is stored in the online disk |
|  | **How does the system record that a file is in near-line storage?** |
| A | It leaves a marker in the directory structure |
| B | It opens the files |
| C | It copies the files |
| D | It moves the files to the new directory |
|  | **What happens when a user tries to access a file in near-line storage?** |
| A | the file will be copied from near-line to online storage |
| B | The file is opened for the user |
| C | The file is move from near-line to online storage |
| D | the file is copied from near-line to offline storage |
|  | **To whom does the user send a request for the retrieval of a file from offline storage?** |
| A | systems administrator |
| B | systems experts |
| C | systems supervisor |
| D | Systems designer |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Talking to Professor Cochrane is probably as close as you can get to time travelling without leaving the current dimension, as his vision stretches far into the 21st century and beyond. His seemingly unshakeable conviction is that anything is possible if you really put your mind to it. In fact, BT (British Telecom) is already sitting on a host of innovations poised to blow your mind during this century.  Designed for the 21st century, Peter Cochrane's signet ring is built around a chip that holds all the details of his passport, bank account, medical records and driving licence. According to Cochrane, it's set to revolutionise shopping. The ring is already a fully operational prototype, but it will be some time before you'll be trading your credit card in for the ultimate fashion accessory.  It's not just jewellery that's set to get smarter. One of the biggest projects down at the Lab is looking at artificial intelligence as a way of creating software programs, networks, telephones and machines with a degree of intelligence built in. By sensing their environment, they should be able to develop new capacities as demands change. 'I have software that is breeding, which is interchanging genes and creating adaptable behavior. This means you'll see the network come alive - it will watch what you do and it will adapt.'  It doesn't stop there, though, as BT has taken artificial intelligence one step further and created machines that are solving their own problems. 'We've created solutions that a human being could never have dreamed of. We have solutions, and although we don't understand how they work, they do work. We're effectively increasing the speed of evolution', says Cochrane. It's already good to talk, but with artificially intelligent phones on the way it will be even better. Cochrane is at present working on smart phones that can translate English into German in real-time. | |
|  | **Of what is Professor Cochrane completely convinced?** |
| A | Anything is possible if you really put your mind to it |
| B | Many things is possible if you really put your mind to it |
| C | Nothing is possible if you want to do it |
| D | Anything is possible if he really put your mind to it |
|  | **What is not stored in the professor's signet ring?** |
| A | Credit card |
| B | medical records |
| C | bank account |
| D | driving licence. |
|  | **What will change dramatically when we start using rings like these?** |
| A | Shopping |
| B | Revolution |
| C | Credit card |
| D | Fashion accessory |
|  | **What is not developed by the BT lab with artificial intelligence?** |
| A | jewellery |
| B | software programs, , |
| C | networks |
| D | telephones and machines |
|  | **What effect are the professor's Al experiments having on evolution?** |
| A | Speed up the evolution |
| B | Creating a new revolution |
| C | Slow down the evolution |
| D | Increase the number of evolution |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| What happened next was astounding, from the conventional, commercial software industry point of view and utterly predictable to anyone who knew about the Free Software Foundation. Programmers (mostly academics and students) began using Linux. They found that it didn't do things they wanted it to do - so they fixed it. And where they improved it, they sent the improvements to Linus, who rolled them into the kernel. And Linux began to grow.  There's a term for this model of software development; it's called Open Source. Anyone can have the source code - it's free. Anyone can contribute to it. If you use it heavily you may want to extend or develop or fix bugs in it — and it is so easy to give your fixes back to the community that most people do so.  An operating system kernel on its own isn't a lot of use; but Linux was purposefully designed as a near-clone of Unix, and there is a lot of software out there that is free and was designed to compile on Linux. By about 1992, the first 'distributions' appeared.  A distribution is the Linux-user term for a complete operating system kit, complete with the utilities and applications you need to make it do useful things — command interpreters, programming tools, text editors, typesetting tools, and graphical user interfaces based on the X windowing system. X is a standard in academic and scientific computing, but not hitherto common on PCs; it's a complex distributed windowing system on which people implement graphical interfaces like KDE and Gnome.  As more and more people got to know about Linux, some of them began to port the Linux kernel to run on non-standard computers. Because it's free, Linux is now the most widely- ported operating system there is. | |
|  | **Who helps to improve Linux?** |
| A | Programmers |
| B | Experts |
| C | Linus Torvalds |
| D | Developers |
|  | **What is the meaning of term ‘conventional’ in the text?** |
| A | Traditional |
| B | General |
| C | Conditional |
| D | Popular |
|  | **What type of utilities and applications are not provided in a Linux distribution?** |
| A | Office suite |
| B | Command interpreters |
| C | Text editors |
| D | Typesetting tools |
|  | **What is X ?** |
| A | distributed windowing system |
| B | graphical user interfaces |
| C | Command interpreters |
| D | KDE and Gnome |
|  | **What graphical user interfaces are mentioned in the text?** |
| A | KDE and Gnome |
| B | X windowing system |
| C | Command interpreters |
| D | Text editors |

**Task 2. Read text and select the correct answer**

|  |  |
| --- | --- |
| Clustering divides data into groups based on similar features or limited data ranges. Clusters are used when data isn't labelled in a way that is favourable to mining. For instance, an insurance company that wants to find instances of fraud wouldn't have its records labelled as fraudulent or not fraudulent. But after analysing patterns within clusters, the mining software can start to figure out the rules that point to which claims are likely to be false.  Decision trees, like clusters, separate the data into subsets and then analyse the subsets to divide them into further subsets, and so on (for a few more levels). The final subsets are then small enough that the mining process can find interesting patterns and relationships within the data.  Once the data to be mined is identified, it should be cleansed. Cleansing data frees it from duplicate information and erroneous data. Next, the data should be stored in a uniform format within relevant categories or fields. Mining tools can work with all types of data storage, from large data warehouses to smaller desktop databases to flat files. Data warehouses and data marts are storage methods that involve archiving large amounts of data in a way that makes it easy to access when necessary.  When the process is complete, the mining software generates a report. An analyst goes over the report to see if further work needs to be done, such as refining parameters, using other data analysis tools to examine the data, or even scrapping the data if it's unusable. If no further work is required, the report proceeds to the decision makers for appropriate action. The power of data mining is being used for many purposes, such as analysing Supreme Court decisions, discovering patterns in health care, pulling stories about competitors from newswires, resolving bottlenecks in production processes. | |
|  | **Which AI technique is used when data isn't labelled?** |
| A | Clustering |
| B | Decision Tree |
| C | Data mining |
| D | Data cleaning |
|  | **Which technique use the hierarchical structure?** |
| A | Decision Tree |
| B | Clustering |
| C | Data warehouses |
| D | Mining software |
|  | **What is the meaning of term ‘refining’ in the text?** |
| A | Tuning |
| B | Defining |
| C | Assigning |
| D | Using |
|  | **What type of data storage is not mentioned in the text?** |
| A | Hard Drives |
| B | Data warehouse |
| C | Desktop databases |
| D | Flat files |
|  | **What action is taken on when the data is unusable?** |
| A | Discard |
| B | Reuse |
| C | Store |
| D | Reprocess |

**Task 2. Read text and select the correct answer.**

|  |  |
| --- | --- |
| Multimedia systems are known for their educational and entertainment value, which we call 'edutainment'. Multimedia combines text with sound, video, animation, and graphics, which greatly enhances the interaction between user and machine and can make information more interesting and appealing to people. Expert systems software enables computers to 'think' like experts. Medical diagnosis expert systems can help doctors pinpoint a patient's illness, suggest further tests, and prescribe appropriate drugs  Connectivity enables computers and software that might otherwise be incompatible to communicate and to share resources. Now that computers are proliferating in many areas and networks are available for people to access data and communicate with others, personal computers are becoming interpersonal PCs. They have the potential to significantly improve the way we relate to each other. Many people today telecommute - that is, use their computers to stay in touch with the office while they are working at home. With the proper tools, hospital staff can get a diagnosis from a medical expert hundreds or thousands of miles away.  Similarly, the disabled can communicate more effectively with others using computers. Distance learning and videoconferencing are concepts made possible with the use of an electronic classroom or boardroom accessible to people in remote locations. Vast databases of information are currently available to users of the Internet, all of whom can send mail messages to each other. The information superhighway is designed to significantly expand this interactive connectivity so that people all over the world will have free access to all these resources.  People power is critical to ensuring that hardware, software, and connectivity are effectively integrated in a socially responsible way. People - computer users and computer professionals are the ones who will decide which hardware, software, and networks endure and how great an impact they will have on our lives. | |
|  | **What is a 'edutainment' system?** |
| A | A system combines education and entertainment |
| B | A system combines sound, video animation and text |
| C | A multimedia system |
| D | An expert system |
|  | **What is the key feature of an expert system?** |
| A | Ability to think |
| B | Pinpoint a patient’s illness |
| C | Suggest further test |
| D | Prescribe drugs |
|  | **What is the meaning of word ‘proliferating’ in the text?** |
| A | Expanding |
| B | Reducing |
| C | Maintaining |
| D | Exporting |
|  | **What types of computing systems are made available to people in remote locations using electronic classrooms or boardrooms?** |
| A | Distance learning and videoconferencing |
| B | Vast databases |
| C | Mail messages |
| D | Information superhighway |
|  | **Who is not mentioned in the text?** |
| A | Students |
| B | Computer users |
| C | Computer professionals |
| D | Disabled |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| Unfortunately, ensuring the security of IoT is not straightforward for three major reasons. First, the IoT’s heterogeneous nature makes it vulnerable to many kinds of attacks. Second, heavyweight protection mechanisms are infeasible for resource-constrained IoT devices. |
| Thật không may, việc đảm bảo an ninh cho IoT không đơn giản vì ba lý do chính. Đầu tiên, bản chất không đồng nhất của IoT khiến nó dễ bị tấn công bởi nhiều loại tấn công. Thứ hai, các cơ chế bảo vệ hạng nặng không khả thi đối với các thiết bị IoT hạn chế về tài nguyên. |

|  |
| --- |
| TL |
| During the discussion of computer networking, Barry described the ideas that would eventually become the Arpanet. It did not capture the group’s attention; we were each focused on our own research goals. |
| Trong cuộc thảo luận về mạng máy tính, Barry mô tả những ý tưởng cuối cùng sẽ trở thành Arpanet. Nó không thu hút được sự chú ý của nhóm; chúng tôi đều tập trung vào các mục tiêu nghiên cứu của riêng mình. |

|  |
| --- |
| TL |
| There is big hope that blockchain technology can address many of the food safety challenges facing the world today. Indeed, some of the most promising blockchain applications outside finance are being developed to address various concerns in the food supply chains. |
| Có rất nhiều hy vọng rằng công nghệ blockchain có thể giải quyết nhiều thách thức về an toàn thực phẩm mà thế giới đang phải đối mặt ngày nay. Thật vậy, một số ứng dụng blockchain hứa hẹn nhất bên ngoài tài chính đang được phát triển để giải quyết các mối quan tâm khác nhau trong chuỗi cung ứng thực phẩm. |

|  |
| --- |
| TL |
| It is often said that difficulties implementing digital transformation have been more about people dealing with change than with the technological tools. And I believe this may be the most significant issue of all. |
| Người ta thường nói rằng những khó khăn trong việc triển khai chuyển đổi số chủ yếu liên quan đến việc mọi người đối mặt với những thay đổi hơn là việc làm quen với các công cụ công nghệ. Và tôi tin rằng, đây là vấn đề quan trong nhất trong tất cả các vấn đề. |

|  |
| --- |
| TL |
| During our discussions that fall, we identified two principles that would guide our work. First, our network services or protocols were to be constructed in layers and these layers would be as thin and as simple as possible. |
| Trong các cuộc thảo luận của chúng tôi vào mùa thu năm đó, chúng tôi đã xác định hai nguyên tắc sẽ hướng dẫn công việc của chúng tôi. Đầu tiên, các dịch vụ hoặc giao thức mạng của chúng tôi phải được xây dựng theo các lớp và các lớp này sẽ càng mỏng và càng đơn giản càng tốt. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| A number of firms in the food industry have started to incorporate blockchain in supply chains. In November 2018, IBM commercially launched its blockchain-based Food Trust. Companies of all sizes can join the network for a subscription fee that ranges from $100 to $10 000 a month. |
| Một số công ty trong ngành thực phẩm đã bắt đầu kết hợp blockchain vào chuỗi cung ứng. Vào tháng 11 năm 2018, IBM đã ra mắt thương mại Food Trust dựa trên blockchain của mình. Các công ty thuộc mọi quy mô có thể tham gia mạng lưới với mức phí đăng ký dao động từ $ 100 đến $ 10000 một tháng |

|  |
| --- |
| TL |
| Transparency is a major factor that is driving the use of blockchain-based applications such as cryptocurrencies. A major question becomes whether transparency provides reasonable privacy protection. |
| Tính minh bạch là một yếu tố chính thúc đẩy việc sử dụng các ứng dụng dựa trên blockchain như tiền điện tử. Một câu hỏi chính trở thành liệu sự minh bạch có cung cấp sự bảo vệ quyền riêng tư hợp lý hay không. |

|  |
| --- |
| TL |
| In general, the cryptographic algorithms that protect network communication are believed to be secure due to theoretical proofs. When vulnerabilities are discovered, they’re generally attributable to misuse, implementation failures, and bad protocol design |
| Nói chung, các thuật toán mật mã bảo vệ giao tiếp mạng được cho là an toàn do các bằng chứng lý thuyết. Khi các lỗ hổng được phát hiện, chúng thường được cho là do sử dụng sai, triển khai không thành công và thiết kế giao thức kém |

|  |
| --- |
| TL |
| We shared our plan to use a simple checksum to catch major errors, including the possibility of incorrectly assembled messages in the IMPs. Frank Heart pushed back very forcefully, booming, “You’ll make my network look slow.” |
| Chúng tôi đã chia sẻ kế hoạch của mình là sử dụng tổng kiểm tra đơn giản để phát hiện các lỗi lớn, bao gồm khả năng các thông báo được lắp ráp không chính xác trong IMP. Frank Heart đẩy lùi rất mạnh, nói oang oang, "Bạn sẽ làm cho mạng của tôi trông chậm chạp." |

|  |
| --- |
| TL |
| Our group was deeply involved in the design and implementation of the network. We had insights, that would help all of us build this technology. If we neglected to capture our thoughts in writing, we would be retreating from our assignment to develop this network |
| Nhóm của chúng tôi đã tham gia sâu vào việc thiết kế và triển khai mạng. Chúng tôi đã có những hiểu biết sâu sắc, sẽ giúp tất cả chúng tôi xây dựng công nghệ này. Nếu chúng tôi lơ là trong việc ghi lại những suy nghĩ của mình bằng văn bản, chúng tôi sẽ rút lui khỏi nhiệm vụ phát triển mạng lưới này. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| First, at that time, academia and industry had very different ideas. In academia, many of us were thinking about the idea of augmenting humans, while in industry this wasn’t much of a topic at all. When I look at the field today, industry and academia are moving in the same direction. |
| Đầu tiên, vào thời điểm đó, giới học thuật và công nghiệp có những ý tưởng rất khác nhau. Trong học thuật, nhiều người trong chúng tôi đã nghĩ về ý tưởng tăng cường sức mạnh cho con người, trong khi trong ngành, điều này không phải là một chủ đề gì cả. Khi tôi nhìn vào lĩnh vực này ngày nay, ngành công nghiệp và học thuật đang di chuyển theo cùng một hướng. |

|  |
| --- |
| TL |
| Bitcoin users are connected to a peer-to-peer (P2P) network. Data continue to flow among the devices connected to the P2P network until everyone has the information related to a transaction. No one, except for the originator, knows who initiated the transaction. |
| Người dùng bitcoin được kết nối với mạng ngang hàng (P2P). Dữ liệu tiếp tục lưu chuyển giữa các thiết bị được kết nối với mạng P2P cho đến khi mọi người có thông tin liên quan đến giao dịch. Không ai, ngoại trừ người khởi tạo, biết ai đã khởi xướng giao dịch. |

|  |
| --- |
| TL |
| Individuals and organizations are likely to suffer more severe consequences from cases of privacy violation if they engage in illegal behaviors using cryptocurrencies (compared with other transaction models). |
| Các cá nhân và tổ chức có khả năng phải chịu hậu quả nặng nề hơn từ các trường hợp vi phạm quyền riêng tư nếu họ tham gia vào các hành vi bất hợp pháp bằng cách sử dụng tiền điện tử (so với các mô hình giao dịch khác). |

|  |
| --- |
| TL |
| In contrast to interface testing, which focuses on commonly used technologies such as web interfaces, proprietary programs are the main targets of system testing. Without having knowledge of such systems, testers often resort to black-box methods, such as fuzz testing. |
| Ngược lại với kiểm thử giao diện, tập trung vào các công nghệ thường được sử dụng như giao diện web, các chương trình độc quyền là mục tiêu chính của kiểm thử hệ thống. Nếu không có kiến thức về các hệ thống như vậy, người kiểm tra thường sử dụng các phương pháp hộp đen, chẳng hạn như kiểm tra mờ. |

|  |
| --- |
| TL |
| Social media systems have been dramatically changing the way news is produced, disseminated, and consumed, opening unforeseen opportunities, but also creating complex challenges. |
| Các hệ thống truyền thông xã hội đã và đang thay đổi đáng kể cách thức sản xuất, phổ biến và tiêu thụ tin tức, mở ra những cơ hội không lường trước được nhưng cũng tạo ra những thách thức phức tạp. |

**Task 3. Translate into Vietnamse**

|  |
| --- |
| TL |
| Not surprisingly, recent research efforts are devoted not only to better comprehend this phenomenon but also to automatize the detection of fake news.2,3,4 While a fully automated approach for the fake news problem can be quite controversial. |
| Không có gì ngạc nhiên khi những nỗ lực nghiên cứu gần đây được dành không chỉ để hiểu rõ hơn về hiện tượng này mà còn để tự động hóa việc phát hiện tin giả. Mặc dù một cách tiếp cận hoàn toàn tự động cho vấn đề tin tức giả mạo có thể gây ra khá nhiều tranh cãi. |

|  |
| --- |
| TL |
| Fact checking is a damage control strategy that is both essential and not scalable. It might be hard to take out the human component out of the picture any time soon, especially if these news regard sensitive subjects such as politics. |
| Kiểm tra sự thật là một chiến lược kiểm soát thiệt hại vừa cần thiết vừa không thể mở rộng. Có thể khó có thể sớm loại bỏ thành phần con người ra khỏi bức tranh, đặc biệt nếu những tin tức này liên quan đến các chủ đề nhạy cảm như chính trị. |

|  |
| --- |
| TL |
| Referring to IoT safety, one can list a number of industries, where IoT device safety is crucial, but rarely is a different perspective brought up: how a cross section of our society is influenced by safety concerns. |
| Đề cập đến an toàn IoT, người ta có thể liệt kê một số ngành, nơi mà an toàn thiết bị IoT là quan trọng, nhưng hiếm khi có một góc nhìn khác: một bộ phận xã hội của chúng ta bị ảnh hưởng như thế nào bởi những lo ngại về an toàn. |

|  |
| --- |
| TL |
| Blockchain is still in early-stage development, and various alternative models and forms of cryptocurrencies are evolving along with it. For instance, to make blockchain more appealing to financial institutions. |
| Blockchain vẫn đang trong giai đoạn phát triển ban đầu và nhiều mô hình và hình thức tiền điện tử thay thế khác nhau đang phát triển cùng với nó. Ví dụ, để làm cho blockchain hấp dẫn hơn đối với các tổ chức tài chính. |

|  |
| --- |
| TL |
| Overall, due to the massive amount of applications that are Internet-enabled, unintended connections arise, new uses emerge, and vendors are losing control over how their products are utilized and may not even anticipate some of the purposes the devices serve. |
| Nhìn chung, do số lượng lớn các ứng dụng hỗ trợ Internet, các kết nối ngoài ý muốn phát sinh, các ứng dụng mới xuất hiện và các nhà cung cấp đang mất quyền kiểm soát cách sản phẩm của họ được sử dụng và thậm chí có thể không lường trước được một số mục đích mà thiết bị phục vụ. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| Cyberbullying is a cybertrust issue that does not get much attention until after an incident occurs. It is hard to tie it directly to security or privacy. It is its own threat category, fitting between security, safety, and privacy. |
| Bắt nạt trên mạng là một vấn đề tin cậy mạng không được chú ý nhiều cho đến khi một sự cố xảy ra. Thật khó để ràng buộc nó trực tiếp với bảo mật hoặc quyền riêng tư. Đây là danh mục mối đe dọa của riêng nó, phù hợp giữa bảo mật, an toàn và quyền riêng tư. |

|  |
| --- |
| TL |
| In the probabilistic approach, the core of the decision process is a statistical model that has been learned from an analysis of training data to learn the structure of a decision model automatically from the observed data (i.e., driver behavior). |
| Trong cách tiếp cận theo xác suất, cốt lõi của quá trình quyết định là một mô hình thống kê được học từ việc phân tích dữ liệu đào tạo để tìm hiểu cấu trúc của mô hình quyết định một cách tự động từ dữ liệu quan sát (tức là hành vi của người lái xe). |

|  |
| --- |
| TL |
| Digital transformation requires a special set of skills and competencies, such as BPM, robotic process automation, cloud computing, emerging technology, agile program management, cybersecurity, and effective internal and external communications skills |
| Chuyển đổi kỹ thuật số đòi hỏi một bộ kỹ năng và năng lực đặc biệt, chẳng hạn như BPM, tự động hóa quy trình bằng robot, điện toán đám mây, công nghệ mới nổi, quản lý chương trình linh hoạt, an ninh mạng và các kỹ năng truyền thông nội bộ và bên ngoài hiệu quả |

|  |
| --- |
| TL |
| The requirement here includes knowledge of business process modeling/management (BPM), robotic process automation (RPA), requirements identification, modeling and validation, and, of course, digital transformation itself. |
| Yêu cầu ở đây bao gồm kiến thức về mô hình hóa / quản lý quy trình kinh doanh (BPM), tự động hóa quy trình bằng robot (RPA), xác định yêu cầu, mô hình hóa và xác nhận, và tất nhiên, chính chuyển đổi kỹ thuật số. |

|  |
| --- |
| TL |
| Some aspects of technology have seen much faster progress than I expected, while others have been much slower. In particular, I thought software development would be well behind hardware development. |
| Một số khía cạnh của công nghệ đã có tiến bộ nhanh hơn nhiều so với tôi mong đợi, trong khi những khía cạnh khác lại chậm hơn nhiều. Đặc biệt, tôi nghĩ phát triển phần mềm sẽ đi sau phát triển phần cứng. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| The foundations of AI have been around for decades. We’ve seen 4 seasons of AI, manifested by the extreme rising and falling of fortunes. What we have now feels different. The growth of big data, the abundance of raw computational power have given rise to economic forces. |
| Nền tảng của AI đã có từ nhiều thập kỷ. Chúng ta đã thấy ít nhất bốn mùa của AI, được biểu hiện bằng sự thăng trầm của vận may. Những gì chúng tôi có bây giờ cảm thấy khác nhau. Sự phát triển của dữ liệu lớn, sự dồi dào của sức mạnh tính toán thô đã làm phát sinh các lực lượng kinh tế |

|  |
| --- |
| TL |
| The technique proved sufficiently successful for computer companies to introduce and distribute small rectangular plastic templates with the symbols used on flowcharts cut out of them. The company name also featured prominently. |
| Kỹ thuật này đã đủ thành công để các công ty máy tính giới thiệu và phân phối các mẫu nhựa hình chữ nhật nhỏ với các ký hiệu được sử dụng trên các sơ đồ được cắt ra từ chúng. Tên công ty cũng nổi bật. |

|  |
| --- |
| TL |
| The access policy tells who can participate in the blockchain network. Public blockchains allow anyone to join and to access the information stored in the blockchain via the Internet; private blockchains are restricted to private networks and selected nodes only. |
| Chính sách truy cập cho biết ai có thể tham gia vào mạng blockchain. Các blockchain công khai cho phép mọi người tham gia và truy cập thông tin được lưu trữ trong blockchain thông qua Internet; các blockchains riêng tư chỉ bị hạn chế đối với các mạng riêng tư và các nút được chọn. |

|  |
| --- |
| TL |
| Fuzzing, the process of providing random input to a program to intentionally trigger crashes, has been around since the early 1980s. A revival of fuzzing techniques is taking place as evidenced by papers presented at top-tier security conferences |
| Mờ hóa, quá trình cung cấp đầu vào ngẫu nhiên cho một chương trình để cố ý kích hoạt sự cố, đã xuất hiện từ đầu những năm 1980. Sự hồi sinh của các kỹ thuật mờ đang diễn ra bằng chứng là các bài báo được trình bày tại các hội nghị bảo mật cấp cao nhất |

|  |
| --- |
| TL |
| Internet of Things (IoT) devices and services are now integral to most daily activities. However, the IoT brings not only added convenience but, by connecting more and more objects to the Internet, new security threats. |
| Các thiết bị và dịch vụ Internet of Things (IoT) hiện là không thể thiếu trong hầu hết các hoạt động hàng ngày. Tuy nhiên, IoT không chỉ mang lại sự thuận tiện hơn mà còn bằng cách kết nối ngày càng nhiều đối tượng với Internet, các mối đe dọa bảo mật mới. |

Task 3. Translate into Vietnamese

|  |
| --- |
| TL |
| Ada Lovelace was perhaps the first person to understand that programming was a thing to itself. Around that same time, George Boole brought a new way of thinking to the mathematicians and philosophers of the world, as expressed in his classic book The Laws of Thought |
| Ada Lovelace có lẽ là người đầu tiên hiểu rằng lập trình là một thứ tự thân. Cũng trong khoảng thời gian đó, George Boole đã mang đến một cách tư duy mới cho các nhà toán học và triết học trên thế giới, như được thể hiện trong cuốn sách kinh điển của ông, Quy luật tư tưởng. |

|  |
| --- |
| TL |
| A BLOCKCHAIN IS a shared, distributed ledger, that is, a log of transactions that provides for persistency and verifiability of transactions.1 A transaction is a cryptographically signed instruction constructed by a user of the blockchain, |
| BLOCKCHAIN LÀ một sổ cái được chia sẻ, phân tán, có nghĩa là, nhật ký các giao dịch cung cấp tính bền vững và khả năng xác minh của các giao dịch.1 Giao dịch là một chỉ dẫn được ký bằng mật mã được xây dựng bởi người dùng blockchain, |

|  |
| --- |
| TL |
| For privacy concerns to be addressed adequately machine-learning (ML) systems, the knowledge gap between the ML and privacy communities must be bridged. This aims to provide the intersection of both fields with emphasis on the techniques used to protect the data. |
| Để các mối quan tâm về quyền riêng tư được giải quyết thỏa đáng trong các hệ thống máy học (ML), khoảng cách kiến thức giữa ML và cộng đồng quyền riêng tư phải được bắc cầu. Điều này nhằm mục đích cung cấp về sự giao nhau của cả hai trường với sự nhấn mạnh vào các kỹ thuật được sử dụng để bảo vệ dữ liệu |

|  |
| --- |
| TL |
| Catching and fixing security and privacy vulnerabilities before they are exploited is a crucial part of computer hardware and software engineering. A growing number of tools are helping engineers assess and test for security weaknesses. |
| Nắm bắt và sửa chữa các lỗ hổng bảo mật và quyền riêng tư trước khi chúng bị khai thác là một phần quan trọng của kỹ thuật phần cứng và phần mềm máy tính. Ngày càng có nhiều công cụ giúp các kỹ sư đánh giá và kiểm tra các điểm yếu về bảo mật. |

|  |
| --- |
| TL |
| Over four summer days in 2017, cybersecurity students at the University of Maryland, Baltimore County (UMBC) analyzed the security of a targeted portion of the UMBC campus network, discovering numerous flaws. |
| Trong bốn ngày hè năm 2017, các sinh viên an ninh mạng tại Đại học Maryland, Baltimore County (UMBC) đã phân tích tính bảo mật của một phần mục tiêu của mạng cơ sở UMBC, phát hiện ra nhiều lỗ hổng. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| User groups, including faculty, staff, and superusers, are defined in a file in NetAdmin’s application directory. Superusers may view, modify, or create any rule for any Internet Protocol address on the UMBC network (not only on the research subnet). |
| Các nhóm người dùng, bao gồm giảng viên, nhân viên và cấp trên, được xác định trong một tệp trong thư mục ứng dụng của NetAdmin. Người quản lý cấp cao có thể xem, sửa đổi hoặc tạo bất kỳ quy tắc nào cho bất kỳ địa chỉ Giao thức Internet nào trên mạng UMBC (không chỉ trên mạng con nghiên cứu). |

|  |
| --- |
| TL |
| IT departments often run obsolete and unpatched systems because they know that updates will take valuable staff time and might break the system, requiring even more staff time to fix. Our study demonstrates that keeping software systems up to date is not optional |
| Các bộ phận CNTT thường chạy các hệ thống lỗi thời và chưa được vá vì họ biết rằng các bản cập nhật sẽ tốn thời gian quý báu của nhân viên và có thể phá vỡ hệ thống, đòi hỏi nhân viên phải có nhiều thời gian hơn để sửa chữa. Nghiên cứu của chúng tôi chứng minh rằng việc cập nhật hệ thống phần mềm không phải là tùy chọn |

|  |
| --- |
| TL |
| In England, there was Bletchley Park, where Alan Turing laid the theoretical foundations for modern computer science. However, it took an engineer—most notably Tommy Flowers—to turn those theories into pragmatic solutions |
| Ở Anh, có Công viên Bletchley, nơi Alan Turing đặt nền tảng lý thuyết cho khoa học máy tính hiện đại. Tuy nhiên, phải cần đến một kỹ sư - đặc biệt nhất là Tommy Flowers - để biến những lý thuyết đó thành những giải pháp thực dụng |

|  |
| --- |
| TL |
| Next to Bitcoin, several alternative platforms have emerged over the last few years. Besides the type of cryptocurrency adopted as incentive mechanism, these platforms distinguish themselves by few key properties. |
| Bên cạnh Bitcoin, một số nền tảng thay thế đã xuất hiện trong vài năm qua. Bên cạnh loại tiền điện tử được chấp nhận làm cơ chế khuyến khích, các nền tảng này còn tự phân biệt bằng một số thuộc tính chính. |

|  |
| --- |
| TL |
| Soft­ware contains bugs, and some bugs are exploitable. Mitigations protect our systems (in the presence of)/(when have) these vulnerabilities, o­en stopping the program once a security violation has been detected. |
| Phần mềm có chứa lỗi và một số lỗi có thể khai thác được. Giảm nhẹ bảo vệ hệ thống của chúng tôi khi có những lỗ hổng này, có thể dừng chương trình sau khi phát hiện vi phạm bảo mật. |

Task 3. Translate into Vietnamese

|  |
| --- |
| TL |
| Automation has been replacing manual activities in workplace for decades. Robots had been most active in blue-collar industrial manufacturing. Now that they are entering office jobs, in the form of software taking over administrative work. |
| Tự động hóa đã và đang thay thế các hoạt động thủ công tại nơi làm việc trong nhiều thập kỷ. Robot đã hoạt động tích cực nhất trong lĩnh vực sản xuất công nghiệp cổ xanh. Bây giờ họ đang bước vào những công việc văn phòng, dưới dạng phần mềm tiếp quản công việc hành chính. |

|  |
| --- |
| TL |
| Enthusiasm for artificial intelligence and multimedia information in the financial industry is at an all time high. Every leader in finance now feels the pressure to answer the question, “What is your AI strategy?” |
| Sự nhiệt tình dành cho trí tuệ nhân tạo và thông tin đa phương tiện trong ngành tài chính luôn ở mức cao chưa từng có. Mọi nhà lãnh đạo trong lĩnh vực tài chính hiện nay đều cảm thấy áp lực phải trả lời câu hỏi, "Chiến lược AI của bạn là gì?" |

|  |
| --- |
| TL |
| Augmented-reality (AR) and virtual-reality (VR) systems are improving in part through software innovations. An Interview with Pranav Mistry” discusses how software advances have enabled various new AR and VR products |
| Hệ thống thực tế tăng cường (AR) và thực tế ảo (VR) đang được cải thiện một phần thông qua các đổi mới phần mềm. Một cuộc phỏng vấn với Pranav Mistry ”thảo luận về cách các tiến bộ phần mềm đã kích hoạt các sản phẩm AR và VR mới khác nhau. |

|  |
| --- |
| TL |
| Grace Hopper suggested that programming is a practical art; Edsger Dijkstra called the art of programming the art of organizing complexity; Donald Knuth referred to programming as art because it produced objects of beauty. |
| Grace Hopper cho rằng lập trình là một nghệ thuật thực tế; Edsger Dijkstra gọi nghệ thuật lập trình là nghệ thuật sắp xếp sự phức tạp; Donald Knuth gọi lập trình là nghệ thuật vì nó tạo ra các đối tượng có vẻ đẹp. |

|  |
| --- |
| TL |
| Blockchain burst on the scene as the bitcoin technology only ten years ago. It was the result of innovative software, and hardware innovations followed as the computationally expensive mining confirmation of transactions was optimized. |
| Blockchain bùng nổ trong bối cảnh công nghệ bitcoin chỉ cách đây 10 năm. Đó là kết quả của phần mềm sáng tạo và các đổi mới phần cứng theo sau khi xác nhận khai thác tính toán đắt tiền của các giao dịch được tối ưu hóa. |

|  |
| --- |
| TL |
| Automation has been replacing manual activities in workplace for decades. Robots had been most active in blue-collar industrial manufacturing. Now that they are entering office jobs, in the form of software taking over administrative work. |
| Tự động hóa đã và đang thay thế các hoạt động thủ công tại nơi làm việc trong nhiều thập kỷ. Robot đã hoạt động tích cực nhất trong lĩnh vực sản xuất công nghiệp cổ xanh. Bây giờ họ đang bước vào những công việc văn phòng, dưới dạng phần mềm tiếp quản công việc hành chính. |

|  |
| --- |
| TL |
| Enthusiasm for artificial intelligence and multimedia information in the financial industry is at an all time high. Every leader in finance now feels the pressure to answer the question, “What is your AI strategy?” |
| Sự nhiệt tình dành cho trí tuệ nhân tạo và thông tin đa phương tiện trong ngành tài chính luôn ở mức cao chưa từng có. Mọi nhà lãnh đạo trong lĩnh vực tài chính hiện nay đều cảm thấy áp lực phải trả lời câu hỏi, "Chiến lược AI của bạn là gì?" |

|  |
| --- |
| TL |
| Augmented-reality (AR) and virtual-reality (VR) systems are improving in part through software innovations. An Interview with Pranav Mistry” discusses how software advances have enabled various new AR and VR products |
| Hệ thống thực tế tăng cường (AR) và thực tế ảo (VR) đang được cải thiện một phần thông qua các đổi mới phần mềm. Một cuộc phỏng vấn với Pranav Mistry ”thảo luận về cách các tiến bộ phần mềm đã kích hoạt các sản phẩm AR và VR mới khác nhau. |

|  |
| --- |
| TL |
| Grace Hopper suggested that programming is a practical art; Edsger Dijkstra called the art of programming the art of organizing complexity; Donald Knuth referred to programming as art because it produced objects of beauty. |
| Grace Hopper cho rằng lập trình là một nghệ thuật thực tế; Edsger Dijkstra gọi nghệ thuật lập trình là nghệ thuật sắp xếp sự phức tạp; Donald Knuth gọi lập trình là nghệ thuật vì nó tạo ra các đối tượng của vẻ đẹp. |

|  |
| --- |
| TL |
| Blockchain burst on the scene as the bitcoin technology only ten years ago. It was the result of innovative software, and hardware innovations followed as the computationally expensive mining confirmation of transactions was optimized. |
| Blockchain bùng nổ trong bối cảnh công nghệ bitcoin chỉ cách đây 10 năm. Đó là kết quả của phần mềm sáng tạo và các đổi mới phần cứng theo sau khi xác nhận khai thác tính toán đắt tiền của các giao dịch được tối ưu hóa. |

**Task 3. Translate into Vietnamese**

|  |
| --- |
| TL |
| Today, individuals can access an ever-increasing number of services via the Internet. However, only when all people are able to completely access the Internet can a digital society be considered universal. |
| Ngày nay, các cá nhân có thể truy cập ngày càng nhiều dịch vụ thông qua Internet. Tuy nhiên, chỉ khi tất cả mọi người đều có thể truy cập Internet hoàn toàn thì xã hội số mới được coi là phổ cập. |

|  |
| --- |
| TL |
| Contemporary software development and implementation projects are increasingly adopting agile methods by tailoring = adjusting and blending agile techniques into a traditional project framework. |
| Các dự án phát triển và triển khai phần mềm đương đại ngày càng áp dụng các phương pháp nhanh bằng cách điều chỉnh và kết hợp các kỹ thuật nhanh vào một khuôn khổ dự án truyền thống. |

|  |
| --- |
| TL |
| According to the US Bureau of Labor Statistics, employment in the fields of computing and information technology is expected to grow faster than most other occupations, with thousands of new jobs created every year. |
| Theo Cục Thống kê Lao động Hoa Kỳ, việc làm trong lĩnh vực máy tính và công nghệ thông tin dự kiến sẽ tăng nhanh hơn hầu hết các ngành nghề khác, với hàng nghìn việc làm mới được tạo ra mỗi năm. |

|  |
| --- |
| TL |
| In Computer’s “How Do We Prepare the Next Generation for a Career in Our Digital Era?,” the author asserts that soft skills such as adaptability and creativity are just as important as technical skills in modern work environments. |
| Trong cuốn Computer’s “Chúng ta chuyển bị gì cho thế hệ tiếp theo cho nghề nghiệp trong kỷ nguyên kỹ thuật số của chúng ta?”, Tác giả khẳng định rằng các kỹ năng mềm như khả năng thích ứng và sự sáng tạo cũng quan trọng như các kỹ năng kỹ thuật trong môi trường làm việc hiện đại. |

|  |
| --- |
| TL |
| Digital transformation is not fragmented digitization; it is a complete rethinking of the overall business model with a customer-driven emphasis supported by the use of digital technologies throughout the business process. |
| Chuyển đổi số không phải là số hóa phân mảnh; nó là sự suy nghĩ lại hoàn toàn về mô hình kinh doanh tổng thể với trọng tâm là khách hàng được hỗ trợ bởi việc sử dụng các công nghệ kỹ thuật số trong suốt quá trình kinh doanh. |